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## OSTEOCALCIN IS RELATED TO HYPERGLYCAEMIA AND INSULIN RESISTANCE BUT NOT LIPIDS IN METABOLIC SYNDROME PATIENTS

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### Background:

Osteocalcin has been reported to reduce insulin resistance in animal models. Insulin resistance plays a major role in metabolic syndrome. Clinical features of metabolic syndrome include hyperglycaemia, dyslipidaemia i.e. increased triglyceride with decreased high density lipoprotein cholesterol (HDL-c), abdominal obesity and elevated blood pressure. Therefore this study was conducted to determine the relationship between osteocalcin, insulin resistance and lipid parameters in metabolic syndrome.

### Materials and Methods:

This was a cross-sectional study of 90 patients with metabolic syndrome according to the International Diabetes Federation consensus worldwide definition (2006). Anthropometric and demographic data were recorded. Fasting blood samples were collected for analysis of lipids, osteocalcin, insulin and fasting blood glucose (FBG). Osteocalcin and insulin were measured by automated immunoassay. Insulin resistance was calculated using the homeostasis model assessment index (HOMA-IR).

### Results:

The mean age for all subjects was  $51.2 \pm 10.7$  years. Generally, they were obese (BMI  $30.1 \pm 5.3$ ) with waist circumference of  $101.3 \pm 10.2$  cm and systolic hypertension ( $143 \pm 17$  mmHg). Diabetics had higher FBG and HOMA-IR but lower osteocalcin compared to non diabetics ( $p < 0.05$ ). There were no differences in the age, body mass index, waist circumference, systolic and diastolic blood pressure, triglyceride, HDL-c, low density lipoprotein cholesterol, total cholesterol and insulin level between diabetics and non-diabetics. Osteocalcin was negatively correlated with FBG ( $p < 0.001$ ) and HOMA-IR ( $p < 0.01$ ) but did not correlate with triglyceride or HDL-c ( $p > 0.05$ ). HOMA-IR was positively correlated with triglyceride ( $p < 0.001$ ) and negatively correlated with HDL-c ( $p < 0.05$ ). In multiple regression analysis, FBG was the only parameter independently associated with osteocalcin.

### Conclusion:

In conclusion, osteocalcin is related to hyperglycaemia and insulin resistance but not dyslipidaemia in metabolic syndrome patients.

### Keywords:

osteocalcin, insulin resistance, metabolic syndrome, hyperlipidaemia.